I Claim:

1. A computer-readable storage medium containing computer executable code for instructing a computer to perform a method of lossless image compression comprising the steps of:

a. taking a sample of pixel neighborhoods from an image file;

b. using said sample of pixel neighborhoods to determine a series of predictive coefficients values related to said pixel neighborhoods;

c. determining prediction residual values based on said coefficients values; and

d. losslessly compressing said prediction residual values.

2. The computer-readable storage medium according to claim 1, wherein coefficient values $c_{i,j}$ and said prediction residual values $e(x,y)$ are determined from the equation:

$$I(x,y) = \sum_{0 \le i,j \le a} c_{i,j} I(x-i, y-j) + e(x,y),$$

3. A computer-readable storage medium containing computer executable code for instructing a computer to perform a method of adjusting the quality parameter in a quality controlled compression routine in order to compress image data a predetermined compression ratio, said method comprising the steps of:

a. receiving a desired compression ratio;

b. selecting an estimated quality value;

c. compressing said image data based on said quality value and calculating an intermediate compression ratio from said compressed image data;

d. adjusting said quality value in iterative steps and recalculating said intermediate compression ratio; and

e. returning a final quality value after a predetermined time period or when said predefined ratio is achieved;

f. compressing said image data to said final quality value using said quality controlled compression routine.

4. The computer-readable storage medium according to claim 3, wherein said estimated quality value is selected from a predetermined maximum quality and a predetermined minimum quality.

5. The computer-readable storage medium according to claim 4, wherein said intermediate compression ratio during an iteration is the dividend of an original image size divided by the size of an image compressed according to the quality value of said iteration.

6. A computer-readable storage medium containing computer executable code for instructing a computer to perform a method of adjusting the compression ratio of image data based upon the available bandwidth of a network link across which said image is transmitted, said method comprising the steps of:

a. determining the size of an image to be transmitted;

b. selecting a desired download time for downing loading said image from a network link;

c. determining a current download time based upon current network conditions;

d. compressing said image if said current download time is greater than said desired download time.

7. The computer-readable storage medium according to claim 6, wherein said image is compress by a ratio greater than or equal to a ratio of said current download time divided by said desired download time.

8. A computer-readable storage medium containing computer executable code for instructing a computer to perform a method of encapsulating audio data in a DICOM object and selectively retrieving said data, said method comprising the steps of:

a. providing a DICOM compliant recording function having parameters representing a recording time and a record size of said audio data;

b. providing a DICOM compliant playback function having a parameter representing a playback start position.

9. The computer-readable storage medium according to claim 8, further comprising the step of providing a DICOM compliant function for converting audio data from a first format into a second format.

10. A computer-readable storage medium containing computer executable code for instructing a computer to perform an improved integer based ray tracing method for constructing two-dimensional images from three-dimensional data, said ray tracing method comprising the steps of:

a. receiving a set of three-dimensional image data containing an object of interest;

b. receiving an observer position;

c. establishing a ray angle from said observer position, through said three-dimensional data, to a two-dimensional image plane;

d. adjusting said ray angle such that the directional components of said ray angle are rational numbers;

e. back projecting from a selected number of picture elements on said two dimensional image plane a series of rays parallel to said ray angle, said rays passing though said three-dimensional image data to origin points;

f. for each ray intersecting said object of interest, determining a relative distance between said origin point and a point of contact where a ray intersects said object of interest;

g. determining a surface angle relative to said origin point for each of said points of contact; and

h. adjusting the intensity of said picture elements on said two dimensional image plane relative to said surface angle of said points of contact.

11. The computer-readable storage medium of claim 10, further including the step of adjusting the origin point of each ray such that the coordinates of said origin point are rational numbers.

12. The computer-readable storage medium of claim 10, wherein said step of determining a relative distance between said origin point and said point of contact includes the step of making a parabolic interpolation.

13. The computer-readable storage medium of claim 10, wherein said step of adjusting the intensity of said picture elements further includes an interpolation based on a second order polynomial.

14. In a computer system including a computer processor, a memory, and a display screen, a method of reducing flicker caused by a magnifying window moving across an image on said display screen, said method comprising the steps of:

a. storing said image in said memory;

b. storing a first window position in said memory;

c. reading a second window position, which overlaps said first window position;

d. determining what portion of said first window position is not covered by said new window position;

e. restoring from memory that portion of said image which corresponds to said portion of said first window not covered by said second window.

15. The method according to claim 14, further including the step of filling said first and second window positions with a magnified portion of said image.

16. The method according to claim 14, wherein said step of determining what portion of said first window position is not covered by said new window position further includes the step of dividing said uncovered portion into two rectangles.

17. The method according to claim 14, further including the step of removing outlying pixel values from a region of said image to be magnified and redistributing remaining pixel values of said region across an intensity spectrum of said computer system.

18. The method of claim 17, further including the step of applying a median filter to said region of said image to be magnified.

19. A radiologist workstation stored on a computer-readable storage medium containing computer executable code for instructing a computer to perform the methods of:

a. losslessly compressing an image by using a sample of pixel neighborhoods to determine a series of predictive coefficients values related to said pixel neighborhoods;

b. lossy compressing an image to a predetermined ratio by adjusting the quality parameter in a quality controlled compression routine;

c. adjusting the compression ratio of image data based upon the available bandwidth of a network link across which said image is transmitted;

d. encapsulating audio data in a DICOM object and selectively retrieving said data;

e. performing an improved integer based ray tracing method by establishing a ray angle from an observer position and adjusting said ray angle such that the directional components of said ray angle are rational numbers; and

f. reducing flicker caused by a magnifying window moving across an image on said display screen by determining what portion of a first window position is not covered by a new window position and restoring from memory that portion of said image which corresponds to said portion of said first window not covered by said second window.